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l4 and (calculat$3 adj3 correct$3 adj3 position)	2

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L5	l4 and (transducer adj5 (crude or oil))	2	L5
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L3	(actuat$3 same (seat or chair)) and (transducer same (crude or oil))	63	L3
L2	(actuat$3 adj3 (seat or chair)) and (transducer same (crude or oil))	3	L2
L1	(actuat$3 adj3 (seat or chair)) and (transducer adj5 (crude or oil))	2	L1

END OF SEARCH HISTORY

End of Result Set

L6: Entry 2 of 2 File: USPT Mar 7, 1989

DOCUMENT-IDENTIFIER: US 4811226 A
TITLE: Optimum angle adjusting apparatus for vehicle equipments

Detailed Description Text (4):
In this manner, the driver of the vehicle can command seat 2 to be displaced to any of its various positions by the actuation of seat control switch 16. By adjusting the seat forward/backward movement, the seat back tilt, the head rest upward/downward movement and the head rest tilt, an optimum driving position can be attained. As shown in FIG. 2, the displacement of the seat is detected by seat displacement detector 18 which comprises a seat forward/backward displacement detector 18A, a seat back tilt displacement detector 18B, a head rest upward/downward displacement detector 18C and a head rest tilt displacement detector 18D, all of which are of similar construction. Each of the detectors includes a photosensor 22 which detects a count corresponding to the number of revolutions of a reversible motor 20 for the seat forward/backward movement, seat back tilt, head rest upward/downward movement or head rest tilt.

Detailed Description Text (5):
Referring to FIG. 3, a seat forward/backward movement mechanism is shown which has a pair of parallel upper rails 24A and 24B fixed to a bottom of the seat 2 and mounted on a pair of lower rails 26A and 26B fixed to a floor of a car body. The rotation of the reversible motor 20 is transmitted to a worm gear 28A fixed to the one upper rail 24A, thence to a worm gear 28B fixed to the other upper rail 24B, through a torque cable 30. The worm gears 28A and 28B engage with slide screws 32A and 32B, respectively, which are fixed to the upper rails 24A and 24B, respectively. Accordingly, the slide screws 32A and 32B move with the upper rails 24A and 24B by the rotation of the motor 20 which is driven by the actuation of the seat forward/backward movement switch 16A so that the seat 2 fixed to the upper rails 24A and 24B is moved in the direction 1 shown in FIG. 3.

Detailed Description Text (26):
When the driver sites on the seat 2, the driver displaces the seat 2 to the optimum position to the driver by actuating the seat control switches 16 such as seat forward/backward movement switch 16A and seat back tilt switch 16B. If the automatic/manual selection switch 52 is switched to the manual position, the driver actuates the selection switch 54 to select the right fender mirror and then adjusts the right fender mirror to the optimum angular position to the driver by actuating the vertical/horizontal selection switch 56.

Detailed Description Text (29):
A second embodiment of the present invention is now explained. In the same manner as in previously described first embodiment, the pesent embodiment comprises the seat driving apparatus driven by the actuation of the seat control switches, the seat displacment detectors, the vehicleequipment driving apparatus, the processing circuit and the vehicle equipment displacement detectors. The only difference resides in the basic formulas used. In the present embodiment, the height H of the driver and the seat forward/backward displacement k.sub.1 are used in the following basic formula.

Detailed Description Text (35):
A third embodiment of the present invention is now explained. In the same manner as in the first and second embodiments, the present embodiment comprises the seat driver driven by the actuation of the seat control switches, the seat displacement detectors, the vehicle equipment drivers, the processing circuit and the vehicle equipment displacement detectors. The difference resides in that an eye position of the driver is calculated.

Detailed Description Text (45):
The correction amouants are calculated to correct the eye position of the driver determined by the position and the angle of the seat 2 because the distance 3 from the head contact point of the head rest 2B to the eyes shown in FIG. 12 is changed in accordance with the physical different features of drivers.

Detailed Description Text (46):
The microcomputer 14 is programmed to operate in accordance with a flow chart shown in FIG. 17. When the manual position is selected by the automatic/manual selection switch 52, an actuation of the seat control switches 54 and the fender mirror control switches are detected, and based on the detection, the fender mirror, etc. are subsequently driven to the selected angular positions by the motors. The correction amount derived from a difference between the selected angle of the fender mirror and the angle calculated based on the position and the angle of the seat is stored in the memory by the actuation of the correction switch 58.

Detailed Description Text (49):
When the driver sits on the seat, the driver actuates the seat control switch 16 such as the seat forward/backward movement switch 16A and the seat back tilt switch 16B to displace the seat 2 to the optimum position for the driver. When the automatic/manual selection switch 52 is switched to the manual position, the driver selects one of the selection switches 54, and based on the selection the driver actuates the vertical/horizontal selection switch 56 to drive the meter 4, the blowing ports of the air conditioner 6, the inner mirror 8, the right fender mirror 10 or the left fender mirror 12 to the optimum angular position for the driver.

Detailed Description Text (50):
When the driver switches the automatic/manual switch 52 to the automatic position and actuates the seat control switches such as the seat forward/backward movement switch 16A and the seat back tilt switch 16B, the seat 2 can be displaced for the optimum position to the driver. The seat displacment detectors 18 including the seat forward/backward displacement detector 18A and the seat back tilt displacement detector 18B detect the manner of displacement of the seat 2 and the detected displacement signals are inputted to the microcomputer 14. The microcomputer 14 calculates the eye position (X, Y) of the driver sitting on the seat 2 in accordance with the detected signals to displace the meter 4, the blowing ports of the air conditioner 6, the inner mirror 8, the right fender mirror 10 and the left fender mirror 12 to the optimum angular positions for the driver on the basis of the calculated eye position.

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L6: Entry 1 of 2 File: PGPB Mar 27, 2003

DOCUMENT-IDENTIFIER: US 20030057910 A1
TITLE: Actuator and family of actuators for a seat and method of manufacturing such an actuator

Abstract Paragraph (1):
The invention relates to an actuator (22) for a seat, of the type comprising, on the one hand, a body (40) and a control element (38) displaceable relative to the body (40), under the control of an actuating motor (36), and, on the other hand, a transducer (42) disposed between the body (40) and the control element (38), said transducer (42) being suitable for providing a raw measurement value representative of the current position of the control element (38) relative to the body (40). It has a unit (46) for correcting said raw measurement value, said correction unit (46) being suitable for implementing a correction algorithm which is specific to said actuator and which is suitable for providing a corrected value for the current position of the actuator on the basis of said raw measurement value. Said correction unit (46) is specific to said actuator and is integrated therein.

Summary of Invention Paragraph (9):
[0007] So that the position of the different seat elements is known at every instant, thereby enabling their displacement to be readily managed, a known approach is to provide in the actuating devices of the seat elements a transducer, such as a potentiometer, enabling raw measurement values representative of the current position of each actuator to be gathered.

Summary of Invention Paragraph (11):
[0009] Accordingly, to move a seat element towards a predetermined position, the actuator is operated until the current raw measurement value provided by the transducer is equal to the predetermined target value corresponding to the intended position of the actuator and hence the corresponding seat element.

Summary of Invention Paragraph (14):
[0012] Consequently, when a faulty actuator is replaced by a new actuator, the seat has to be re-programmed, otherwise the response of the seat to a user operation may not be satisfactory owing to the tolerances and inaccuracies of the actuator.

Summary of Invention Paragraph (15):
[0013] The object of the invention is to propose an actuator for a seat element, which will enable the actuator to be readily replaced with another, without any malfunctions of the seat occurring.

Summary of Invention Paragraph (17):
[0014] To this end, the invention relates to an actuator for a seat element of the type outlined above, characterised in that it has means for correcting said raw measurement value, said correction means being suitable for defining a correction algorithm which is specific to said actuator and which is suitable for providing a corrected value for the current position of the actuator on the basis of said raw measurement value, and in that said correction means are specific to said actuator and are integrated therein.

Summary of Invention Paragraph (21):

[0018] the actuator is isolated from a seat before being mounted on the seat;

Summary of Invention Paragraph (22):
[0019] said correction algorithm depends solely on the structural characteristics specific to said actuator and is independent of the structure of the seat for which it is intended; and

Summary of Invention Paragraph (29):
[0026] Finally, the invention relates to a method of manufacturing an actuator intended to be mounted in a seat, the actuator comprising, on the one hand, a body and a control element which can be moved relative to the body, under the control of an actuating motor, and, on the other hand, a transducer disposed between the body and the control element, said transducer being suitable for providing a raw measurement value representative of the current position of the control element relative to the body, characterised in that means for correcting said raw measurement value are integrated in the actuator, said correction means being suitable for defining a correction algorithm which is specific to said actuator and which is suitable for providing a corrected value for the current position of the actuator on the basis of said raw measurement value, and in that it includes a phase during which the correction algorithm defined by said correction means is customised for the specific actuator before the actuator is mounted on the seat.

Brief Description of Drawings Paragraph (6):
[0035] FIG. 4 is a graph illustrating the calculations carried out during the calibration process and during the calculation of corrected position values;

Brief Description of Drawings Paragraph (9):
[0038] FIG. 7 is a schematic view of an actuating system for a seat as proposed by the invention, incorporating the actuator illustrated in FIG. 6 and a control unit.

Detail Description Paragraph (6):
[0043] A key pad 26 or any other control element is fixedly joined to the seat to enable the user to control each actuator of the seat separately and directly. The key pad also enables the seat to be placed in several predetermined configurations by a single command acting on several actuators. These configurations include, for example, a meal configuration, a landing configuration and a sleeping configuration.

Detail Description Paragraph (14):
[0051] Furthermore, two other predetermined threshold values, denoted by P.sub.min and P.sub.max, are stored in the memory 33 for each actuator. These predetermined threshold values are displacement limit values and correspond to the end positions permitted for the actuator in the seat and thus define its range of displacement for the seat in question.

Detail Description Paragraph (29):
[0066] The calibration phase of the actuator is carried out in the factory, before the actuator is delivered to the seat manufacturer. This calibration phase represents the final phase of manufacturing the actuator.

Detail Description Paragraph (58):
[0092] Once the actuator has been mounted on the seat, the control unit 28 is in a form suitable for implementing a set of control algorithms for each actuator in order either to displace a seat element when prompted by a direct command of the user or to displace this seat element as far as a predetermined target position associated with a predetermined seat configuration required by the user.

Detail Description Paragraph (71):
[0105] Furthermore, the algorithm illustrated in FIG. 5 is suitable for permitting a comparison between the values of the current consumed by each of the actuators and predetermined threshold values and for issuing a command to stop each actuator if the associated predetermined threshold value is exceeded. Furthermore, the control unit advantageously has means for calculating the cumulative operating time of the actuator from the time the actuator is mounted on the seat and means for counting the number of times it has been operated since it was mounted on the seat.

Detail Description Paragraph (72):
[0106] It will be appreciated that, by using actuators so calibrated, prior to mounting, so that they all supply substantially a same corrected measurement value for a same position, a faulty actuator on a seat can be replaced by an actuator from the same family without the need to modify the programming of the seat, and in particular the control unit 28. After such a replacement, the real positions obtained when a replacement actuator is being controlled will be strictly identical to those obtained with the original actuator.

Detail Description Paragraph (80):
[0113] This calibration phase is carried out before the actuator is mounted on the seat.

CLAIMS:

1. Actuator for a seat of the type comprising, on the one hand, a body and a control element displaceable relative to the body, under the control of an actuating motor, and, on the other hand, a transducer disposed between the body and the control element, said transducer being suitable for providing a raw measurement value (P.sub.lue) representative of the current position of the control element relative to the body, wherein said actuator has means for correcting said raw measurement value (P.sub.lue), said correction means being suitable for defining a correction algorithm which is specific to said actuator and which is suitable for providing a corrected value (P.sub.corr) for the current position of the actuator on the basis of said raw measurement value (P.sub.lue), and in that said correction means are specific to said actuator and are integrated therein.

4. Actuator as claimed in claim 1, wherein said actuator is isolated from a seat before being mounted on the seat.

5. Actuator as claimed in claim 1, wherein said correction algorithm depends solely on the structural characteristics specific to said actuator and is independent of the structure of the seat for which it is intended.

7. Actuating system for a seat, comprising at least one actuator as claimed in claim 3, and a control unit for the or each actuator, which control unit is linked to the or each actuator so as to receive from the or each actuator the raw measurement value (P.sub.lue) and said defining parameters for the algorithm, and in that the control unit has a data processing unit suitable for providing said corrected value (P.sub.corr) on the basis of said received raw measurement value (P.sub.lue) by implementing the correction algorithm on the basis of said received parameters defining the algorithm.

8. Actuating system for a seat, comprising at least one actuator as claimed in claim 4, and a control unit for the or each actuator, which control unit is linked to the or each actuator so as to receive from the or each actuator the raw measurement value (P.sub.lue) and said defining parameters for the algorithm, and in that the control unit has a data processing unit suitable for providing said corrected value (P.sub.corr) on the basis of said received raw measurement value (P.sub.lue) by implementing the correction algorithm on the basis of said received parameters defining the algorithm.

9. Actuating system for a seat, comprising at least one actuator as claimed in claim 5, and a control unit for the or each actuator, which control unit is linked to the or each actuator so as to receive from the or each actuator the raw measurement value (P.sub.lue) and said defining parameters for the algorithm, and in that the control unit has a data processing unit suitable for providing said corrected value (P.sub.corr) on the basis of said received raw measurement value (P.sub.lue) by implementing the correction algorithm on the basis of said received parameters defining the algorithm.

10. Actuating system for a seat, comprising at least one actuator as claimed in claim 6, and a control unit for the or each actuator, which control unit is linked to the or each actuator so as to receive from the or each actuator the raw

measurement value (P.sub.lue) and said defining parameters for the algorithm, and in that the control unit has a data processing unit suitable for providing said corrected value (P.sub.corr) on the basis of said received raw measurement value (P.sub.lue) by implementing the correction algorithm on the basis of said received parameters defining the algorithm.

15. Method of manufacturing an actuator intended for mounting on a seat, the actuator comprising, on the one hand, a body and a control element which can be moved relative to the body under the control of an actuating motor, and, on the other hand, a transducer disposed between the body and the control element, said transducer being suitable for providing a raw measurement value (P.sub.lue) representative of the current position of the control element relative to the body, wherein means for correcting said raw measurement value are integrated in the actuator, said correction means being suitable for defining a correction algorithm which is specific to said actuator and which is suitable for providing a corrected value (P.sub.corr) for the current position of the actuator on the basis of said raw measurement value (P.sub.lue), and in that it includes a phase during which the correction algorithm defined by said correction means is customised for the specific actuator before the actuator is mounted on the seat.

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(actuat$3 same (seat or chair)) and (transducer same (crude or oil))	63

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L2	(actuat$3 adj3 (seat or chair)) and (transducer same (crude or oil))	3	L2
L1	(actuat$3 adj3 (seat or chair)) and (transducer adj5 (crude or oil))	2	L1

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L1: Entry 1 of 2 File: EPAB May 15, 2002

DOCUMENT-IDENTIFIER: EP 1205133 A1
TITLE: Actuating device of a seat element and seat comprising the same

Abstract Text (1):
CHG DATE=20021101 STATUS=O> The system, consisting of actuators (26, 28) for an adjustable seat back (18) and leg rest (20), linked to a transducer furnishing a crude value for current actuator positions, has a control unit (30) with calculators (80, 84) giving a corrected value, and memories (88) for the corrected and threshold values. The control unit also has an input (94) for reference positions, and a refined correction value setter (92).

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L1: Entry 2 of 2 File: DWPI May 15, 2002

DERWENT-ACC-NO: 2002-385630
DERWENT-WEEK: 200242

TITLE: Reclining seat actuating system has calculators for corrected values of actuators to set groups of seats in same positions

Basic Abstract Text (1):
NOVELTY - The system, consisting of actuators (26, 28) for an adjustable seat back (18) and leg rest (20), linked to a transducer furnishing a crude value for current actuator positions, has a control unit (30) with calculators (80, 84) giving a corrected value, and memories (88) for the corrected and threshold values. The control unit also has an input (94) for reference positions, and a refined correction value setter (92).

Standard Title Terms (1):
RECLINING SEAT ACTUATE SYSTEM CALCULATE CORRECT VALUE ACTUATE SET GROUP SEAT POSITION

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☑ 1. Document ID: EP 1205133 A1

L1: Entry 1 of 2 File: EPAB May 15, 2002

PUB-NO: EP001205133A1
DOCUMENT-IDENTIFIER: EP 1205133 A1
TITLE: Actuating device of a seat element and seat comprising the same

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☑ 2. Document ID: EP 1205133 A1 FR 2816184 A1

L1: Entry 2 of 2 File: DWPI May 15, 2002

DERWENT-ACC-NO: 2002-385630
DERWENT-WEEK: 200242

TITLE: Reclining seat actuating system has calculators for corrected values of actuators to set groups of seats in same positions

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Clip Img | Image

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Terms	Documents
(actuat$3 adj3 (seat or chair)) and (transducer adj5 (crude or oil))	2

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L3: Entry 18 of 63 File: USPT Apr 3, 2001

DOCUMENT-IDENTIFIER: US 6209188 B1
TITLE: Flexible tooling method

Detailed Description Text (19):
Referring now to FIG. 10, a side partially cutaway view of an active actuator system according to the present invention, the features and operation thereof will be described. Operation and structure of some components of the active actuator system correspond to similar components of the passive actuator system. The active actuator system 200 is employed in conjunction with a table 202 which corresponds to the table 12 of the passive actuator embodiment described hereinbefore and includes an actuator well 204 which receives the actuator therein and may include a seal 206 to keep contaminants from entering below the table and contaminating components of the actuator. An end effector 208 is positioned at the end of the actuator body and in the illustration of FIG. 10 employs a swivel head vacuum clamp member. The active system comprises a number of main components, including clamp body 210 which is operative to clamp and unclamp the stroke rod 212, for holding the stroke rod in a desired position as well as for halting upward or downward movement of the stroke rod at a precise position. An actuator cylinder body member 214 supports the stroke rod 212 as well as the various plumbing and electrical members as discussed herein. A top view is provided of the cylinder body member 214, which is suitably formed as an extrusion and then cut to the desired length (determined by the stroke length of the actuator), in FIG. 11 and is discussed hereinbelow. A linear transducer 216 is provided within the actuator system to accurately describe the current extended position of the stroke rod, while mounted therebelow is an intensifier 218 which operates in a corresponding manner to the intensifier described hereinbefore with reference to FIG. 7. The intensifier thus employs a relatively low pressure pneumatic supply to intensify a relatively small volume of hydraulic fluid, e.g. oil, to provide a high pressure clamping force for the clamp body 210. Mounted below the intensifier is valve and controller body 220 which includes solenoid valves for switching the flow of pneumatic and hydraulic supply for directing the up-and-down and clamp-and-unclamp operations of the system. A controller is also provided which receives commands from a central control over a network (see FIG. 16) to position the stroke rod to the desired height for operation and governs operation of the solenoids to accurately position the actuator. The system also includes an oil reservoir 222 which stores the hydraulic fluid and which also, as governed by speed valve 226, enables a flow rate to be modified to change the speed at which the stroke rod 212 extends or retracts.

Detailed Description Text (25):
When movement of the rod is desired, then the intensifier is caused to extend, thereby raising the oil pressure in line 296 which causes the clamp member to expand outwardly thus enabling the actuator to move upwardly or downwardly, since the clamp member is in an interference fit with the rod during those times at which the intensifier is not supplying pressure to the high pressure oil line. Once the actuator rod is appropriately positioned, a determination may be made via a linear transducer whether the rod actually was positioned within a desired tolerance range. If desired, it is possible in accordance with the present invention to unclamp the rod and then reposition. Positioning accuracy is further enhanced by calibration on an occasional basis, to determine the time required for clamping to be effective. Thus, to calibrate the system, the actuator is caused to move (suitably at low

speed, for increased accuracy) and the clamp command is given while simultaneously measuring the actuator's position as reported by the linear transducer. Then, the final position of the actuator is read from the transducer after the actuator stops moving and the difference between the position when the clamp command was given and the actual clamped position is determined and factored in for future clamping commands, so that the clamp command is given at the appropriate time.

Detailed Description Text (29):
Referring now to FIG. 12, which is a top view of the interface portion 224 of a table which receives and connects with an individual actuator, the air pressure is provided via a coupling 232 while vacuum is provided to coupling 234. Both couplings are connected to respective pneumatic and vacuum supplies which are suitably provided at each position on the table suitable for receiving an actuator therein. The couplings are normally closed when not connected to an actuator such that no air or vacuum leak occurs in table positions which do not have actuators placed therein. An electrical interface 236 is also provided and suitably provides ground, power, and twisted pair communication for RS-485 or other multi-drop network communication standard. Corresponding connectors are provided on the actuator which mate with couplings 232 and 234 and electrical connector 236 such that when the actuator is positioned and lowered into the table, couplings 232 and 234 and connector 236 interconnect with their corresponding parts on the actuator itself. Both connectors 234 and 232 as well as the electrical interface 236 are mounted in a "floating" fashion such that longitudinal and lateral movement is allowed (X-Y) to accommodate slight misalignment as the actuator is inserted into the table. This ensures that the actuator does not bind or become misaligned so as to damage the connector or not properly seat in the table. An addressing means 240 is also provided, which in the illustrated embodiment comprises an eight position DIP switch. The address of the individual table position is accordingly set by operation of the switches on the DIP switch. Accordingly, the RS-485 address of this particular table position may be uniquely set at installation time. Thus, an actuator may be moved from any position on the table to any other position on the table without the need for reprogramming of the actuator, since each individual table position has its own unique address. The RS-485 standard enables up to 256 addresses on an individual bus. Since a particular application of the present invention employs up to 1200 or more table positions, multiple hubs are employed, each hub having no more than 256 individual table positions addressed thereon.